



## *Invitation for Questions*

European Plant Science Organisation  
[www.epsoweb.org](http://www.epsoweb.org)

# **Invitation to submit questions for the EC-EPSO Conference on Plant Breeding Techniques, at the EXPO in Milano**

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**On the 14<sup>th</sup> of July the EC and EPSO are organising a conference on Plant Breeding Techniques as part of the EXPO Milano 2015. We invite you to send your questions to the expert panel of speakers either directly or through [Twitter](#) via the hashtag #expocrops.**

The programme is available [here](#).

Feeding a global population set to reach 9 billion by 2050 will require a 70% increase in global agricultural output. At the same time, there is a growing demand for plant-derived biomass beyond livestock feed to support the bioeconomy. In the face of climate change and finite natural resources, there is an additional requirement for the plant sector to reduce input use and greenhouse gas emissions.

Securing a sustainable global supply of high quality food and feed, and supplying renewable biomass for the production of bio-based products and energy are key priorities for both European and global society. In the coming decades, the European plant sector will play a central and essential role in meeting this challenge and achieving this will depend strongly on the generation and transfer of new knowledge, and greater innovation in the plant sector.

EPSO, the European Plant Science Organisation, has been organising the European Commission Programme conference Crop genetic improvement technologies for a sustainable and productive agriculture addressing food and nutritional security, climate change and human health to take place on 14 July 2015 in Milano. Presenting and discussing societal challenges and the various plant breeding technologies which can help to address them, the conference will bring together participants from Europe and beyond, including science, industry, farmers, policy and civil society.

In the beginning, we will ask the question: Which challenges can we help to address?

Using the example of several case studies we will try to find answers on the question: How can we help to address the challenges with various Crop Genetic Improvement Technologies?

From the perspectives of different stakeholders we will discuss the question: How to increase Europe's competitiveness and ability to address societal challenges?

In the final Discussion with the speaker panel based on social media and the audience you are invited to ask questions directly or submit them via twitter using the hashtag #expocrops.

### **Background information**

Plant breeding for improvement of plant-derived products used for human nutrition, feeding of domesticated animals or fiber production has been performed for thousands of years. It is always composed of three steps: (i) Accessing the biodiversity via its genetic diversity, (ii) Selecting the desired trait(s), and (iii) Developing varieties through integration of the trait(s) into elite lines.

Starting with conventional breeding, crossing of superior plants obtained by selection breeding has been for a long time the only possible method to improve cultured plants. Such traditional breeding techniques have been complemented since the last century by conventional mutagenesis, translocation breeding and intergeneric crosses leading to a more sophisticated exploitation of the existing natural genetic variation by plant breeders.

With the upcoming of genetic engineering in the 1980s, plant breeding made a step from mostly cisgenic approaches towards transgenic plants in which genes from non-crossable organisms (e.g. bacterial Bt-toxin) are introduced by different transformation techniques. These transgenic plants are produced by undirected approaches delivering the transgene (or cisgene) in a not further specified location of the plant genome. From the beginning, the potential risks of transgenic techniques were analysed and a complex GMO regulatory system was put in place which is based on the technique rather than the product. In transgenic plants of the first generation input traits like herbicide tolerance and insect resistance have been modified. Currently these traits are present in over 180 mill hectares cultivated crop p.a. providing benefits mainly for seed companies and farmers. In second generation transgenic plants mainly output traits like starch composition or content of health-promoting substances have been introduced. Thus the second generation transgenic plants focus more on consumers' interests worldwide. Furthermore, transgenic plants are increasingly established as production platform for pharmaceuticals or other valuable substances.

Since then the development of breeding techniques progressed rapidly resulting in much more sophisticated methods to create plants containing new traits. These techniques are summarized as New Plant Breeding Techniques and especially the genome editing and modification techniques including oligo-directed mutagenesis (ODM) and site directed nucleases (SDN) are tools for sequence-specific changes in the plant genome. Thus precision-based mutation approaches can now be used which, unlike chemical or radiation mutagenesis, do not create hundreds of additional mutations throughout a genome.

These breeding techniques are complementary, not mutually exclusive and are essential tools to meet the challenges of agriculture.

The EU plant sector makes a vital contribution to building the Knowledge-Based Bio-Economy, to meeting the challenges of food security and safety, to mitigating the effects of climate change, to ensuring sustainable agriculture and to maintaining employment in Europe. The EU plant breeding sector is a strategic sector which has

responded to several major global challenges over the past 100 years. It has contributed, and continues to contribute, to the creation of benefits for the EU economy and society as a whole: these positive effects can only be achieved if plant breeders can deploy all appropriate tools which include conventional breeding, genetic engineering, the New Plant Breeding Techniques and other emerging technologies.

Based on **Research, Innovation, and Education Action Plans to 2020** developed and broadly discussed by the **European Technology Platform “Plants for the Future”** (<http://www.plantetp.org/index.php/home/action-plans-to-2020>)

the European agriculture sector will find answers to the questions:

- How can future research contribute to innovative solutions for societal and market challenges?
- How can innovation be boosted and research-to-market be shortened?
- How to secure people and work force for the plant sector and bioeconomy?
- How to embed plant and agricultural sector in society?

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#### **Useful links**

Plant ETP [Action Plans on Innovation, Research and Education](#), 24.3.2015

EPSO: [Crop Genetic Improvement Technologies, Statement](#), 26.2.2015

EPSO: [Plant breeders' rights and patent rights, Statement](#), 26.2.2015

EPSO: [GMO cultivation – national opt-out, Statement](#), 26.2.2015

J-C Juncker to MEPs: [‘A new start for Europe: My agenda for jobs, growth, fairness and democratic change’](#), 15.7.2014

EPSO: [Science Based Policy](#), 1.9.2013

EASAC: Report [“Planting the Future”](#), 2013

EC: New Techniques Working Group: Final Report of the European Commission, 2012

Plant ETP: [Statement on New Breeding Technologies](#), September 2012

EPSO Working Group on Agricultural Technologies: [www.epsoweb.org/agricultural-technologies-wogr](http://www.epsoweb.org/agricultural-technologies-wogr)

EPSO communications: [www.epsoweb.org/epsos-communications](http://www.epsoweb.org/epsos-communications)

EPSO member institutes and universities: [www.epsoweb.org/membership/members](http://www.epsoweb.org/membership/members)

EPSO representatives: [www.epsoweb.org/membership/representatives](http://www.epsoweb.org/membership/representatives)

#### **About EPSO**

EPSO, the European Plant Science Organisation, is an independent academic organisation that represents more than 220 research institutes, departments and universities from 28 European countries, Australia, Japan and New Zealand, and 3.100 individuals Personal Members, representing over 28 000 people working in plant science. EPSO's mission is to improve the impact and visibility of plant science in Europe, to provide authoritative source of independent information on plant science, and to promote training of plant scientists to meet the 21st century challenges in breeding, agriculture, horticulture, forestry, plant ecology and sectors related to plant science. [www.epsoweb.org](http://www.epsoweb.org)